the first contact took place. During the time occupied in perfecting the necessary preliminaries, I noted the position and the structure of the cloud-banks which were instilling into our minds feelings of the keenest anxiety. We were standing in the centre of what I may describe as a comparatively cloudless longitudinal "slit" in the sky, which was otherwise completely covered; so that, while over our heads the sun was shining brightly, its refulgence obscured only occasionally by light, fleecy, flying clouds; to our front and rear were lying parallel lines of heavily-banked "cumuli-strata" running from south-west outh-east. Perhaps the accompanying rough diagram (Fig. 1) may serve to illustrate their position in relation to our own.

I also set down the following readings of the barometer and thermometer (wind N.N.W.):—

	At first contact.			Five minutes before totality.	At 2.20 P.M.
Barometer	28·65	28·79	28·88	28·80	28·75

At first contact.

Thermometer in shade	56°
„ in sun exposed to wind	54°
„ in sun	58°

Immediately after totality.

Thermometer in sun exposed to wind	55°

Two minutes before the commencement of totality, the clouds behind us, and those in front of us, were black and threateningly lowering, as if a thunderstorm were imminent. Etna, which lay well in our view to the N.N.W., was clothed to its very base with a shroud of the most sombre clouds, while as the seconds flew by the temperature fell sensibly lower and lower.

To the S., and S.W. also, the sky was filled by a strange, steamy, V-shaped (the point of the V being near the earth), filmy mist, through which the sun showed such a feeble and uncertain light, as to give me cause for fear lest our observations should be brought to an abrupt and resultless termination by the total disappearance of the sun behind this curious veil. *Immediately* before totality commenced, a dark vaporous shadow glided very swiftly up over the heavens from the westward, or a little south of west, and, as it came on towards us, seemed to swallow up the earth, leaving it dark in its rear, until at the moment of totality it reached the sun. As it drew near him, a herd of oxen feeding behind us, with one or two exceptions, lay down. With the beginning of totality the air was colder than ever, and for about one minute's space, not more, there fell a small thin rain, which I fancy must have been the result of the condensation of the steamy mist which I have a little while ago described. Of totality itself, as a spectacle, I am almost afraid to speak. To endeavour to describe the inconceivable grandeur of the sight would be a hopeless task. I can only say that nothing will ever efface it from my memory. But if I cannot hope to give you any idea of the sublimity of the scene, at any rate I will do my best to state simply the appearances which I saw. Round the dark moon gleamed the luminous circle of the corona, shining with about half the radiance of an English sun upon a winter's afternoon; while there streamed forth from it in eight directions as many sets of brilliant rays. These "sets" of rays were composed of four sets in the position of a Greek cross, as in Fig. 2; with a St. Andrew's cross, as in Fig. 3, placed upon it, forming something similar to Fig. 4, Fig. 3 extending only about half as far as Fig. 2, which reached as far outwards as the apparent diameter of the sun.

I described the phenomenon to Mr. Ranyard as having struck me by its resemblance to the "glory" round the heads of statues of saints in Roman Catholic shrines.

Jarvis and Burgoyne also made sketches of the "rays" separately, and without consultation with me or with each other, at my request. The similarity of the three is striking. Jarvis described the rays as resembling "the pipes of an organ."

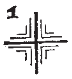

Fig. 2.

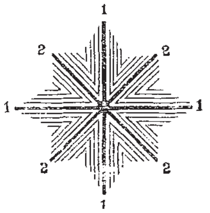

Fig 4.

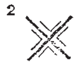

Fig. 3.

As the moon passed off from the sun's face, and for some seconds after the contact had wholly ceased, the clouds in the S.E. were suffused with deep red copper colours, which gradually faded away as the sun regained his power. During totality I made the following observations (according to Mr. Ranyard's previous request) with a Nicol's prism with Savart's bands, in the use of which instrument Mr. Ranyard had instructed me, and with which I had constantly practised during our week's preliminary residence in camp at Agosta; viz., I determined the polarisation of the sky at two points: (1) high up on the sky to the S.E. of the sun; (2) under the sun; and at both these points I found the plane of polarisation to be vertical. Totality ceased while I was taking a third observation.

Before concluding these imperfect remarks, which I have only ventured to make public because I thought that they might be of some interest, from the fact of my having had the good fortune to be one of the very few who obtained a perfectly clear and distinct view of the Eclipse during totality, I should like to bear my testimony to the great kindness of Colonel Porter, R.E., in placing all the resources at his command at the service of our party, and to his care of our creature comforts during our ten days' "dwelling in tents" under his charge. It is but just also to mention the zeal and alacrity displayed by his party of Sappers, and their intelligence in mastering the details of duties which were certainly new to them. Nor will it be considered out of place if, in conclusion, I thank the authorities of Agosta, and the Italian astronomers of distinction who did so much, not only by giving us every assistance in their power to render our stay at Agosta so successful, but also by their hospitable attentions to make it as enjoyable as possible. For my own part I can only say that I shall always look back with feelings of pleasure to the Sicilian Eclipse Expedition of 1870.

HENRY SAMUELSON

NOTES

THE Royal Commission on Scientific Instruction and the Advancement of Science is now in full work. This week they meet three times, and last week they met twice.

IT has been announced at the Royal Geographical Society that Livingstone has arrived at Ujiji on his return journey.

THE Hunterian Oration has been delivered this year by Sir W. Fergusson, who *inter alia*, according to the *Times* report, "playfully referred to the suggestion of a distinguished philosopher, whose views appeared in the columns of the *Times* last autumn, that when the microscope did not seem to give satisfaction in minute research, imagination might be substituted; and pointed out that this style of philosophy was not new, for it had been put into Hamlet's mouth by Shakespeare:—

> Imperial Cæsar, dead, and turned to clay,
> Might stop a hole to keep the wind away."

MR. J. C. BUCKMASTER has been appointed by Her Majesty's Commissioners to deliver an address on the value of the International Exhibition, with its bearing on industrial instruction, designed particularly for the working classes in all the large towns of the country which express a desire to hear it.

SCIENCE has derived many wrinkles from the siege of Paris, and we now learn from the correspondent of the *Daily Telegraph* that all the galleries of the Louvre are filled with sacks of earth to protect the interior from shells ; and the damp and comparative warmth of the last few days have provoked active vegetation, so that the bags are covered with grass and weeds; each window is converted into a lively and promising garden. If the arrangement is left undisturbed much longer, we shall have flower beds there. This is certainly a novel kind of window-gardening, which we have no desire to see introduced into this country.

M. STEENAEKERS is about to issue a report on aëronautical ascents which took place during the siege of Paris. Individual reports are asked from aëronauts, but, unfortunately, very few of them are in a position to give a correct idea of their impressions, being mostly sailors of the Royal Navy.

AMONGST the learned men who escaped from Paris in a balloon we must cite M. d'Almeida, author of a treatise on Physics. He escaped on the 17th of December, at one o'clock in the morning, in the "Guttemberg," with four or five other persons. The "Guttemberg" was despatched a few minutes after the "Parmentier," which carried three persons and a bag of letters, and fell within Prussian lines. M. d'Almeida landed at Sanson, eight miles from thence, but he has not been heard of since that time, and it is to be feared that he was taken prisoner with his companions and sent to some German fortress.

THE French Government had amalgamated the post-office and telegraphs during the siege of Paris, under the management of M. Steenaekers, for the whole of France except the besieged capital. This reform was inaugurated in imitation of the English system under the pressure of circumstances. But a retrograde step was taken a few days ago, and two different services have been created as formerly. It is to be hoped that so unscientific a measure will soon be cancelled.

FRENCH *savants* do not appear to be successful politicians under universal suffrage. Amongst more than 2,000 citizens who offered themselves as candidates to the Parisian electors, we notice only a few members of the French Académie des Sciences. The only names who have come under our notice are M. Sainte-Claire Deville (we do not know if it is Henri or Charles), and M. Nelaton, the physician who cured Garibaldi's wound. M. Berthelot was also a candidate, but he does not belong to the Académie des Sciences. The Académie Française was more successful, as Michelet, Victor Hugo, Henri Martin, Thiers, Jules Favre, and many others, were chosen.

WE learn from the *British Medical Journal* that the distinguished ophthalmologist, Dr. Liebreich, has just passed an examination and been admitted a member of the Royal College of Surgeons. It is stated that he will be invited to accept the ophthalmic chair of St. Thomas's Hospital.

THE death is announced of Dr. Sheridan Muspratt, F.R.S., the well-known analytical chemist of Liverpool, and author of a Dictionary of Chemistry.

THE following is the list of officers and council of the Royal Microscopical Society for the current year :—President : W. K. Parker, F.R.S. Vice-Presidents : Chas. Brooke, F.R.S., J. E. Gray, F.R.S., J. Millar, F. H. Wendham. Treasurer : Richard Mestayer. Secretaries : Henry J. Slack, Jabez Hogg. Council : R. Braithwaite, M.D., John Berney, James Glaisher, F.R.S., W. J. Gray, M.D., Henry Lawson, M.D., Henry Lee, Jas. Murie, M.D., G.W. Royston Pigott, M.D., J. W. Stephenson, Chas. Stewart, Chas. Tyler, T. C. White. Assistant Secretary : Walter W. Reeves.

MR. A. R. WALLACE has printed his Anniversary Address, delivered before the Entomological Society on Jan. 23rd. After referring to the loss Entomology has sustained during the past year by the death of J. T. Lacordaire and A. H. Haliday, and to the publication of Mr. Crotch's papers on the Genera of Coleoptera studied chronologically, McLachlan's Catalogue of British Neuroptera, Dr. A. S. Packard's Guide to the Study of Insects, and some other works of the year, the greater part of the address is occupied by a critique on Mr. Andrew Murray's important paper "On the Geographical Relations of the chief Coleopterous Faunæ." Of Mr. Murray's division of the Coleoptera of the world into three grand stirpes or races—the Indo-African, the Brazilian, and the Microtypal—the first comprehending all the characteristic forms of the eastern tropics, the second all those of tropical America, and the third those of the temperate regions of the whole world, not excluding even America—Mr. Wallace remarks that the two first will probably be generally accepted, while the third group, as of equal value to the others, will be as generally rejected. Mr. Murray's theory, derived from the geographical distribution of the Coleoptera, that the whole of the Atlantic Islands, from the Azores to the Cape de Verdes, and even to St. Helena, are portions of a vast submerged continent connected with Southern Europe, is combated by Mr. Wallace as far as the Madeira group is concerned, while he considers there is more to be said in favour of their connection with one another at some remote period.

THE third session of the Ladies' Educational Association of London is considered a successful one. The number of tickets issued has been :—for English Literature, 56; English Language, 40 ; Psychology and Logic, 46 ; French Literature, 39 ; French Language, 20 ; Experimental Physics, 25 ; Chemistry, 10 ; Total, 236, against 292 last year. The falling off is almost entirely in the class of English Literature, in which 104 tickets were issued last year, a decrease of 48 in the present session. The attendance is reported as regular. Lecture associations of a similar kind for ladies have also been established in the northern and eastern districts of the metropolis.

THE Annual Report of the Canadian Natural History Society states that the recent dredgings of Mr. Whiteaves have added many facts to our knowledge of the creatures which inhabit Canadian seas. The marine mollusca have been carefully monographed, and instead of 60 or 70 species, we now know of nearly 130, the number having been thus nearly doubled. The careful identification of the inhabitants of the deep sea, in addition to its zoological importance, will do much to illustrate the conditions under which the Canadian post-tertiary deposits have been accumulated.

WE have on our table a number of important papers referring to the Colony of Victoria, prepared by Mr. W. H. Archer, Registrar-general to the Colony, and published by authority of the Colonial Government : viz. Patents and Patentees from 1854 to 1866, Abstracts of Specifications of Patents applied for from 1854 to 1866 Ac. to Bu., and Indexes to Patents and Patentees for 1867 and 1868. Also Reports of the Mining Surveyors and Registrars for the quarter ending Sept. 30th, 1870, Report on the present condition of the Geological Survey of the Colony, and Abstracts of English and Colonial Patent Specifications relating to the Preservation of Food, &c., compiled from original documents, by Mr. W. H. Archer. We would call especial attention to the last as a well-arranged epitome of very useful information.

DR. M. T. MASTERS and Dr. J. H. Gilbert reprint from the *Proceedings of the Royal Horticultural Society* "Reports of Experiments made in the Gardens of the Society at Chiswick in 1869 on the Influence of various Manures on different Species of

Plants." The experiments afford striking illustrations of the varying powers of accumulation and assimilation possessed by plants belonging to different families, to different genera of the same family, and even to different species of the same genus, under the same external conditions of supply in soil and atmosphere, indicating, as the authors think, not only very varying ranges of root-collection, but also quantitatively varying functional characters, both of the feeders and the elaborating organs. It is expected that results of considerable practical value to agriculturists will be obtained from the second series of experiments which were conducted during 1870. The Royal Horticultura Society appears to be applying its resources to a very useful end in the carrying out of these investigations.

WE have received from Mr. F. Bradley, of Chicago, a pamphlet, entitled "Northern Lights, Shooting Stars, and other Meteoric Phenomena proved to be not of modern origin," in which he explains several well-known Biblical figures by the supposition of an acquaintance on the part of the writers with the phenomena of the Aurora Borealis, and combats the views of a recent writer that the alleged occurrence of the Aurora within the last three centuries for the first time, is a sign of the approaching end of all things.

THE great difficulty which has been experienced by farmers during the present winter in procuring sufficient food for their cattle may have the effect of directing attention to fresh substitutes for the ordinary winter keep. Turnips and Swedes have been a complete failure throughout a large breadth of the country, and the hay crop has been generally so deficient that many agriculturists have been already brought to the verge of ruin. In the Argentine Republic, as is well known, vast herds of cattle are reared upon the natural grasses of the pampas, or upon the lucerne which grows there in great abundance, but in the province of Catamarca both man and beast depend for support mainly upon the leaf and fruit of the algarrobo. It provides their principal stock of food during the winter months, and is said to be exceedingly nutritious. The algarrobo (*Hymenæa Courbaril-Jetaiba*) is indigenous to the country, and its fruit is gathered annually and stored with much care. The long pods are pounded in a wooden mortar, and the residuum is then passed through a sieve, and the meal converted into circular cakes, which, after having been dried in the sun, are fit for use. In this state it is called "patay," and is exported as a bread-stuff into other districts of the Republic, in some of which it forms the exclusive food of the people. Its merits as a means for fattening cattle are also thoroughly appreciated, and it might be a great boon to our farmers, if the Acclimatisation Society would ascertain whether the algarrobo might not be introduced into this country with advantage. The tree grows to a height of forty feet, with wide-spread branches, and a rather slender stem, and flourishes best upon a dry soil.

CONSIDERABLE discusion took place in the *Times* last autumn as to whether acorns were suitable for employment as food for cattle; and the evidence adduced certainly favoured a negative view. Dr. Robert Brown, however, tells us that those produced in California by several species of oak form an important article of food. "The acorns of California are mostly large, and the trees in general produce abundantly, though in some years there is a great scarcity, and much misery ensues among the poorer natives. The acorns are gathered by the squaws, and are preserved in various methods. The most common plan is to build a basket with twigs and rushes in an oak tree and keep the acorns there. The acorns are prepared for eating by grinding them and boiling them with water into a thick paste, or by baking them into bread. The oven is a hole in the ground about eighteen inches cubic. Red-hot stones are placed in the bottom, a little dry sand or loam is placed over them, and next comes a layer of dry leaves. The dough or paste is poured into the hole until it is two or three inches deep; then comes another layer of leaves, more sand, red-hot stones, and finally dirt. At the end of five or six hours the oven has cooled down, and the bread is taken out, an irregular mass, nearly black in colour, not at all agreeable to the eye or to the palate, and mixed with leaves and dirt."

THE Proceedings of the Somersetshire Archæological and Natural History Society for 1868-69, just published, consists almost entirely of papers which would come under the first head. The only ones bearing directly on Natural Science are "On the Geology of the Mendips," by Mr. C. Moore, and "On the Rodentia of the Somerset Caves," by Mr. W. A. Sanford. Is it necessary that Reports of the Proceedings of Local Societies should be published at so high a price as practically to take them out of the reach of the general public?

MR. F. ABBOTT has reprinted a paper read at the meeting of the Royal Society of Tasmania, Oct. 11, 1870, "On the Sun and its Office in the Universe."

WE recently referred to Mr. Townend Glover's paper "On the Food and Habits of Beetles," issued in the Report of the Commissioner of Agriculture for Washington. A work, similar in style, but more comprehensive, has been published by the Board of Agriculture for the State of Missouri, which has secured "an appropriation for this purpose from the Legislature of the State." This "First Annual Report on the noxious, beneficial, and other Insects of the State of Missouri" is furnished by Mr. Charles V. Riley, State Entomologist, and from its plain descriptions, and rough, yet accurate, woodcuts, seems admirably adapted to fulfil the purpose for which it is published—that of giving the farmer a knowledge of his insect friends and foes which he may turn to practical account.

THE *Geraniaceæ*, taken as a whole, are by no means noted for their economic properties. In Tasmania, however, a form of the common *Geranium dissectum* having a thick rootstock is employed by the aborigines, who are in the habit of digging up the large, fleshy roots and roasting them for food. About Launceston it is called "native carrot," and is common throughout the colony. The typical form of *G. dissectum* is generally diffused over the temperate regions of the northern hemisphere in th Old World, where it is annual. In the Eastern United States a biennial or annual form, *G. carolinianum*, takes its place, the typical *G. dissectum* being only known as an introduced weed; although connecting links between the two may readily be detected. West of the Rocky Mountains the stock often appears to be perennial, and it cannot then be distinguished from some of the Australian forms.

WE may call attention to an interesting paper, reported in our present number, by Mr. Cecil Smith, read before the Somersetshire Natural History Society, on the relations of the Great Bustard, which has once more visited England during this severe winter. Mr. Smith removes the bird from the Rasores, among which it was placed by Mr. Yarrell, and restores it to the position assigned it by Cuvier, among the Grallatores, near to the Plovers.

THE question of killing deadly snakes at Government expense in India is again under discussion. The Government is losing its subjects at the rate of above a hundred a day, or 40,000 a year by snake bites, but it fears losing rupees in the crippled state of its treasury. The last enforcement of the law was under Mr. Commissioner Plowden, many years ago in the Bancorah district, one of the smallest portions of the Burdwan division. Deadly snakes were brought in at the rate of some 1,200 a day, and although the scale was only from threepence to sixpence apiece, in about a couple of months 10,000*l*. was drawn out of the treasury, and the Government ordered the snake crusade to be stopped.